

Remarks/Arguments:

A. Status of the Claims

Claims 18-34 were pending when the Office Action was mailed on October 3, 2005. No claims have been amended, canceled, or added. Therefore, claims 18-34 remain pending.

B. The Negative Limitation “and not with a non-solvent” Is Supported by Applicants’ Specification

Claims 18-34 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner contends that there is no written support for the recitation in claim 18 of “not with a non-solvent.”

Applicants disagree. The specification includes written support for the phrase “not with a non-solvent.” For instance, in one non-limiting aspect, the specification describes:

The solvent or mixture of solvents of the thermoplastic material to be treated may contain, in limited proportion, **up to 20% by weight**, preferably up to 15% by weight of an organic diluent which is **not a solvent** of the thermoplastic material to be treated. An example of such an organic diluent is ethylene glycol diacetate.

Specification at page 5, lines 1-4 (emphasis added). The above passage clearly describes that a non-solvent can be used in one embodiment of the present invention. This is sufficient to satisfy the written description requirement. MPEP 2173.05(i) (“If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims”).

Additionally, the language “up to 20% by weight” describes that 0% to 20% of the non-solvent can be used. The 0% range provides further written support for Applicants’ claimed limitation “wherein the fine grinding and/or the polishing comprises attacking the principal surface of the article with a solvent or a mixture of organic solvents **and not with a non-solvent** of the transparent thermoplastic material.” Claim 18 (emphasis added). In fact, this is confirmed by the specification:

In the attack step, **the solvent or mixture of solvents is preferably pure, in other words it contains only the solvent or mixture of solvents** and during the attack on the surface of the article, in particular a polycarbonate article, only the thermoplastic material of the article is dissolved in this solvent or these solvents.

Specification at page 5, lines 5-9 (emphasis added). Also, the non-limiting examples in the specification describe the attack step being performed with a solvent or a mixture of solvents and not with a non-solvent. *Id.* at pages 12-14.

Further, as noted in Applicants' previously filed July 25, 2005, response the phrase "non-solvent" is positively recited in the specification. Specification at page 2, lines 20-21. The Examiner's argument that "[u]nless applicant can show somewhere else in the specification where 'without a non-solvent' is specifically taught as an embodiment of the instant invention [Applicants have done so—see above], it is respectfully submitted that the instant amendment introduces new matter which was not disclosed in the original specification" is improper and contrary to the appropriate written description standard that should be used. For instance, the Federal Circuit has stated that the standard for determining written description includes determining whether "the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." MPEP § 2163.02 (*quoting In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989)). The description on page 2, lines 20-21, alone or in combination with the description on page 5, lines 1-9, clearly allows a person of ordinary skill in the art to recognize that Applicants have invented what is claimed—*i.e.*, "...wherein the fine grinding and/or the polishing comprises attacking the principal surface of the article with a solvent or a mixture of organic solvents and not with a non-solvent." Again, in one aspect, the inventors contemplate an attack step where "the solvent or mixture of solvents is preferably pure, in other words it contains **only** the solvent mixture or mixture of solvents...." Specification at page 5, lines -6 (emphasis added).

In view of the above, it is clear that the specification provides written support for the phrase "and not with a non-solvent." Therefore, the rejection of claims 18-34 under 35 U.S.C. § 112, first paragraph, is overcome and should be withdrawn.

C. The Obviousness Rejection Is Overcome

1. Summary of Rejection

Claims 18-34 continue to be rejected under 35 U.S.C. § 103(a) as being obvious "over the admitted prior art as set forth at page 1, line 7 through page 2, line 11 of the instant specification in view of Duchane *et al.*..." The Action at page 3. The Examiner contends that "...it is believed that one of ordinary skill in the art would understand from this disclosure that the surfaces treated with only a solvent would have macroscopically smooth surfaces. It is submitted that these macroscopically smooth surfaces would be the instant smooth surfaces." *Id.*

Applicants disagree. Claims 18-34 are not obvious over the cited art. A *prima facie* case of obviousness has not been established.

2. There Is No Motivation To Modify or Combine Duchane With the "Admitted Prior Art"

The Examiner appears to ignore his burden of showing a motivation to modify or combine the teachings of Duchane with a mechanical step (*e.g.*, grinding) to polish a surface. MPEP § 2142. Instead, the Examiner makes a blanket statement that "...it is respectfully submitted that one of ordinary skill in the art would have knowledge of solvent polishing techniques and would have used these **in lieu of** mechanical polishing." The Action at page 4 (emphasis added). This statement is not supported by any evidence and is therefore insufficient to establish a *prima facie* case of obviousness. MPEP § 2142. If the examiner continues to maintain this speculative position, Applicants request that an affidavit be prepared with evidence supporting his position pursuant to 37 C.F.R. § 1.104(d)(2).

Further, the Examiner's statement appears to miss the point (*i.e.*, "in lieu of" suggests instead of or in place of). Applicants' claimed invention includes a **combination** of a mechanical step (*e.g.*, grinding) with "attacking the principal surface of the article with a solvent or a mixture of organic solvents and not with a non-solvent of the transparent thermoplastic material." This claimed combination is discouraged by Duchane. *See* Applicants' July 25, 2005, Response at pages 10-11 which is incorporated by reference. For instance, Duchane explains that "[f]urthermore, it is difficult to produce super-smooth surface finishes on polymers by mechanical means because heat produced by frictional processes is dissipated much more slowly by plastics than by metals or glass...." Duchane at col. 1, lines 41-52.

Additionally, it is undisputed that Duchane explicitly states that "it appears that a nonsolvent is **necessary** to achieve a super-smooth surface." Duchane at col. 8, lines 17-21 (*emphasis added*). In fact, Duchane discloses that the use of a solvent **without** a non-solvent produces surfaces that have "transverse ripples, rounded pits, and lumps" or have "a blistered appearance" with "white, circular imperfections." *Id.* at col. 8, lines 8-16 and 37-43. Stated another way, Duchane appears to indicate that if a non-solvent is used in combination with a solvent, a polished surface is obtained, but that if a solvent is used without a non-solvent, an unpolished "wrinkled" surface is obtained. *Id.*; *see also* col. 2, line 33.

Therefore, at least two things can be taken away from Duchane: (1) it discourages using a mechanical step; and (2) the use of a solvent without a non-solvent produces a "wrinkled" appearance. *See* MPEP § 2143.01 (noting that "[i]f the proposed modification would render the prior art invention being modified unsatisfactory for its intended purposed, then there is no suggestion or motivation to make the proposed modification."). This is strong evidence that

there is no motivation to modify Duchane or combine its teachings with the “admitted prior art” to arrive at Applicants’ claimed invention.

If anything, Duchane teaches away from Applicants’ claimed invention. *See In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (noting that “[a] reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.”). A person of ordinary skill in the art, upon reading Duchane, would be discouraged from polishing a surface with a mechanical step (*see* Duchane at col. 1, lines 41-52) and also would be discouraged from using only a solvent to polish a surface (*id.* at col. 8, lines 8-43). If anything, Duchane suggests **not** using a mechanical step and instead suggests using a solvent in combination with a non-solvent to obtain a polished surface. This is strong evidence of non-obviousness. MPEP § 2145 (“A prior art reference that ‘teaches away’ from the claimed invention is a significant factor to be considered in determining obviousness...”).

It is clear that there is no motivation to modify or combine Duchane with the “admitted prior art” to arrive at Applicants’ claimed invention. Therefore, the present obviousness rejection cannot be maintained and should be withdrawn.

3. There Is No Reasonable Expectation of Success That Modifying Duchane to Include Applicants’ Claimed Invention Would Work

The Examiner fails to present any rebuttal to Applicants’ previous arguments that show there is no reasonable expectation of success of modifying Duchane to attack “the principal surface of the article with a solvent or a mixture of organic solvents and not with a non-solvent” or to combine such a step with a “grinding” step. Applicants incorporate the previous arguments made in its July 25, 2005, Response into this section by reference. In summary, Duchane

appears to indicate that the use of a solvent without a non-solvent produces a surface that has “ripples, rounded pits, and lumps” and that mechanical polishing processes have inherent difficulties that limit the effectiveness of their polishing capabilities. Therefore, upon reading Duchane, a person of ordinary skill in the art would expect to obtain an undulating surface that has a “wrinkled appearance” by combining these two processes.

Based on the teachings of Duchane, there appears to be little if any expectation of obtaining a polished surface by using Applicants’ claimed invention—much less a reasonable expectation of success.

4. The Cited Art Fails To Disclose Every Element of Applicants’ Claimed Invention

The cited art also fails to disclose Applicants’ claimed element of “[a] method of surface polishing...attacking the principal surface of the article with a solvent or a mixture of organic solvents and not with a non-solvent of the transparent thermoplastic material.” Claim 18. The Examiner concedes that this element is not disclosed by the “admitted prior art.” October 6, 2004, Office Action at page 2.

As for Duchane, the Examiner’s argument that “it is believed that one of ordinary skill in the art would understand from this disclosure that the surfaces treated with only a solvent would have macroscopically smooth surfaces” is incorrect, supported by no evidence (either extrinsic or intrinsic), and contrary to the teachings in Duchane. For instance, it is undisputed that Duchane discloses that “it appears that a nonsolvent **is necessary** to achieve a super-smooth surface. The nonsolvent allows the controlled extract of the solvent from the substrate.” Duchane at col. 8, lines 17-21 (emphasis added). Also, it is clear that a polished surfaced is not obtained in Duchane when a non-solvent is not used:

- “An acrylic rod was immersed in pure acetone for 5 minutes, then removed, and allowed to dry...Microscopic examination at about 20-40X showed that surface

scratches had been eliminated but that transverse ripples, rounded pits, and lumps were now present.” *Id.* at col. 8, lines 8-16.

- “An acrylic rod was exposed to vapor from boiling acetone for about 5 minutes...Upon removal from the treatment chamber, the surface was clear and superficially smooth at first, but the surface gradually took on a blistered appearance as white, circular imperfections began to form on it. *Id.* at col. 8, lines 37-43.

Further, Duchane indicates that “super-smooth” means a “surface quality wherein all defects are smaller than about $4\ (\mu\text{m})^2$ in area.” *Id.* at col. 2, lines 53-55. This reference is silent regarding the roughness as measured by a mean deviation of the roughness profile from the mean line (Ra).

In a non-limiting aspect, Applicants’ claimed invention reduces the Ra value. As shown in the drawings, using the solvent attack of the claimed invention leads to low Ra values (*see, e.g.*, FIGS. 18, 20, 21, and 24). With these low Ra values, the surface could be described in certain aspects as microscopically super-smooth. A person of ordinary skill in the art cannot infer from Duchane that the so-called “super-smooth” surface would have Ra values as small as those described in the non-limiting sections of Applicants’ specification. Consequently, the Examiner’s statement that the Duchane “macroscopically smooth surfaces would be the instant smooth surfaces” is ungrounded.

Because the Action fails to show all of the elements necessary to establish a *prima facie* case of obviousness, the present rejection cannot be maintained. Applicants request that this rejection be withdrawn.

5. Applicants’ Dependent Claims Are Not Disclosed By Duchane

Applicants’ dependent claims are not disclosed by Duchane. For instance, dependent claim 23 is direct to “[a] method of surface polishing...wherein the attacking is performed by contacting the principal surface with a vapor of the solvent or mixture of solvents.” In contrast,

the collaborators in Duchane exposed an acrylic rod “to vapor from boiling acetone for about 5 minutes.” Duchane, col. 8, lines 37-43. Instead of obtaining a polished surface, the collaborators obtained a surface that had “a blistered appearance as white, circular imperfections began to form on it.” *Id.* It appears that the “blistered appearance” was visible apparent without the use of a microscope (compare with Example 1 which indicates that “[m]icroscopic examination” was used).

Dependent claim 29 is directed to “[a] method of surface polishing...wherein attacking comprises attacking by centrifugation of the solvent or the mixture of organic solvents and an attacking with a vapor phase of the solvent or mixture of organic solvents.” Duchane does not appear to mention “centrifugation of the solvent”—much less suggest combining such a technique with a “vapor phase” technique. In fact, there does not appear to be any motivation to make such a modification or a reasonable expectation of success that such a modification would work.

D. Conclusion

Applicants believe that the present document is a full and complete response to the Office Action dated October 3, 2005. The present case is in condition for allowance, and such favorable action is respectfully requested.